UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/554,021	10/21/2005	Nicholas Michael Ian Noble	NL030483	7851

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EXAMINER
BOR, HELENE CATHERINE

ART UNIT	PAPER NUMBER
3768	

MAIL DATE	DELIVERY MODE
03/24/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 December 2007*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1.   A request for continued examination under 37 CFR 1.114, including the fee set

forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this

application is eligible for continued examination under 37 CFR 1.114, and the fee set

forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action

has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on

12/122007 has been entered.

Claim Rejections - 35 USC § 103

2.   The text of those sections of Title 35, U.S. Code not included in this action can

be found in a prior Office action.

3.   Claim 1, 5, 7-14 17-20 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Jolly'494 (US Patent Application No. 2003/0069494 A1) and further

in view of Melton'521 et al. (US Patent No. 5,195,521).

Claim 1, 11 & 16: Jolly'494 teaches a method of determining total left ventricular

interior volume (Page 2, Para 0033) during a cardiac cycle from a cardiac cine series

(Page 5, Para 0058). Jolly'494 teaches delineating endocardial and epicardial contours

of a left ventricle in all slices of said cine series at end-diastole (ED) (Page 3, Para 0034

& 0040) and applying the endocardial contours delineated at ED to all phases of the

cardiac cycle (Page 3, Para 0040). Jolly'494 teaches calculating the total LV interior

volume based on intensity values for each of the phases (Page 1, Para 0002-0004 &

Page 5, Para 0059) inside the endocardial contours delineated at ED (Page 1, Para

0007, Page 2, Para 0033 & Page 4, Para 0042) and applied to all the to all the phases

[ED & ES] (Page 5, Para 0059).   Jolly'494 teaches a using a suitable commercial

cardiac analysis package and a computer platform with an operating system and micro

instruction code. Jolly'494 teaches implementing the invention in various hardware,

software or combinations thereof (Page 3, Para 0035). Jolly'494 fails to teach

calculating a total ED intensity value. Jolly'494 teaches calculating a histogram of the

image and using the Gaussian to determine whether a pixel belongs to the middle

Gaussian, which corresponds to the myocardium (Page 3, Para 0042). However,

Melton teaches the total area of the cross-section of the blood in the ventricle V is found

by adding all the incremental areas (Col. 8, Line 19-41 & Abstract) in order to have as

an alternative method of calculating the ventricle volume as Jolly'494 does (Page 3,

Para 0042). It would have been obvious to one of ordinary skill in the art to modify the

Gaussian values as taught by Jolly'494 to be represented as a total intensity value as

taught by Melton'521 in order to provide an alternative method of calculating the

ventricle volume as Jolly'494 does (Page 3, Para 0042).

Claim 5: Jolly'494 teaches a method wherein the cine series is a short-axis

study of the heart (Figure 2, Element a & c) consisting of multiple slices covering at

least the left ventricle and multiple phases within the cardiac cycle (Page 5, Para 0058).

Claim 7: Jolly'494 teaches a method wherein the cine series is captured

previously to said method on a device for imaging inside parts of a mammal body (Page

1, Para 0004 & Page 5, Para 0058).

Claim 8: Jolly'494 teaches a method with a device for magnetic resonance imaging inside parts of a mammal body (Page 1, Para 0004).

Claim 9: Jolly'494 teaches a method wherein an MRI study comprises true Fast Imaging with Steady-State Precession (true FISP) also known in the art as Steady State Free Precession (SSFP) images (Page 5, Para 0058).

Claim 10: Jolly'494 teaches a method for compensating motion of the heart (Page 1, Para 0005 & Page 1 Para 0007 - 0011).

Claim 12: Jolly'494 teaches a computer program for automatically delineates the endocardial and epicardial contours (Page 3, Para 0040 & 0041).

Claim 13: Jolly'494 teaches wherein the compensating act includes deleting contribution of the myocardium enclosed in the endocardial contours (Figure 3, Element 302, 310 & 314).

Claim 14: Jolly'494 teaches wherein the contribution of the myocardium enclosed in the endocardial contours is removed (Figure 3, Element 302, 310 & 314).

Claim 18-20: Jolly'494 teaches manually delineating an endocardial contour (Page 5, Para 0058). Jolly'494 teaches using signal intensity to calculate the image volume (Page 2, Para 0023 & 0033). Jolly'494 teaches forcing the image volume to coincide with the manual contour using a calculated factor and applying the factor to images of the slice (Page 5, Para 0059).

4.   Claim 2-4, 6, 15 & 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jolly'494 (US Patent Application No. 2003/0069494 A1) and in view of Melton'521

et al. (US Patent No. 5,195,521) as applied to claim 1, 5, 7-14 17-20 above and further

in view of Avinash'682 et al. (US Patent No. 6,980,682 B1).

Claim 2: Jolly'494 teaches using the intensity for performing calculations on the

myocardium and blood voxels at the ED based on the delineated endocardial and

epicardial contours (Page 1, Para 0007, Page 2, Para 0033 & Page 4, Para 0042).

Jolly'494 teaches compensating for myocardium enclosed in the endocardial contours

delineated at the ED during subsequent phases of the cardiac cycle (Page 3, Para 0034

& 0040, Page 3, Para 0040 & Figure 3, Element 302, 310 & 314). Jolly'494 and

Melton'521 fail to teach using the mean of the intensity for the calculations. However,

Avinash'682 teaches using the mean of the intensity for the calculations (Col. 8, Line 8-

24). It would have been obvious to one of ordinary skill in the art at the time the

invention was made to modify the method of Jolly'494 and Melton'521 to include the

teachings of Avinash'682 in order to produce greater accuracy and requires minimal

user interaction (Col. 3, Line 35-40).

Claim 3: Jolly'494 teaches using intensities for the myocardium enclosed in the

endocardial contours delineated at ED (Page 3, Para 0034 & 0040) during subsequent

phases of the cardiac cycle (Page 3, Para 0040) and the compensating act (Figure 3,

Element 302, 310 & 314). Jolly'494 and Melton'521 fail to teach using mean intensities.

However, Avinash'682 using the mean intensities for compensating for myocardium

enclosed in the endocardial contours (Col. 7, Line 1-18 & Col. 8, Line 8-24). It would

have been obvious to one of ordinary skill in the art to modify the method of Jolly'494

and Melton'521 to include the teachings of Avinash'682in order to provide greater

accuracy and requires minimal user interaction (Col. 3, Line 35-40).

Claim 4, 15 & 17: The following equation as claimed, is not taught by the cited

references verbatim. However, Jolly'494 teaches calculating the LV interior volume is

calculated (Page 2, Para 0033). Jolly'494 also teaches evaluating the total number of

slices (Page 4, Para 0049) and the calculating interior volume of the LV at end-diastole

(Page 3, Para 0034 & 0040). Jolly'494 teaches the detected intensity of the slice within

the endocardial delimitation (Page 1, Para 0011) at ED (Page 3, Para 0040).

Claim 6: Jolly'494 teaches comprising determining the LV volume from cine

sequences Jolly'494 and Melton'521 fails to teach acquiring the images while the heart

is under stress. However, Avinash'682 teaches evaluating the heart while under stress

(Col. 1, Line 51-62). It would have been obvious to one of ordinary skill in the art to

modify the method of Jolly'494 and Melton'521 to include the teachings of Avinash'682

in order to observe abnormalities induced by stress (Col. 1, Line 56).

Response to Arguments

5.   Applicant's arguments filed 12/12/2007 have been fully considered but they are

not persuasive. In response to applicant's arguments against the references

individually, one cannot show nonobviousness by attacking references individually

where the rejections are based on combinations of references. See *In re Keller*, 642

F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231

USPQ 375 (Fed. Cir. 1986). The Applicant asserts that Jolly'494 is concerned with

myocardium contours. The Examiner agrees that concerned with contours, however,

the contours are used to determine ventricular blood volume (Page 1, Para 0001-0004).

The Applicant asserts that Avinash'682 is directed to using seed points and comparing

neighboring intensities. The Examiner agrees that to the summary of Avinash'682,

however, the rejection was not made on Avinash'682 alone but in combination with

Jolly '494 and Melton'521 with motivation to combine the references.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to HELENE BOR whose telephone number is (571)272-

2947. The examiner can normally be reached on M-T 8:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. B./   /Eric F Winakur/
Examiner, Art Unit 3768   Primary Examiner, Art Unit 3768